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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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Dead Once More

See Page 70

A SCIENCE SERVICE PUBL ON

Radio-relay station at Evanston, Wyoming

a Watcher for lonesome places

Many of the Bell System's 107 radio stations connecting New York and San Francisco by microwave radio-relay stand on hills and mountains far from towns. Day after day, the apparatus does its duty; no man need be there to watch it. But when trouble threatens, an alarm system developed by Bell Telephone Laboratories alerts a testman in a town perhaps a hundred miles away.

Alarm-receiving bay in town. Lights on a chart report on 42 separate conditions affecting service. Telephone is to communicate with maintenance crews. Eleven alarm centers across the country cover all 107 radio-relay stations. Stations too far off the beaten trail for wire connections signal by very high frequency radio.

A bell rings. The testman sends a signal which asks what is wrong. A pattern of lights gives the answer—a power interruption, an overheated tube, a blown fuse, a drop in pressure of the dry air which keeps moisture out of the waveguide. At intervals the testman puts the system through its paces to be sure it is on guard.

Sometimes the testman can correct a trouble condition through remote control, or the station may cure itself—for example, by switching in an emergency power supply. Sometimes the trouble can await the next visit of a maintenance man—sometimes he is dispatched at once.

This is one of the newest examples of the way Bell Laboratories adds value to your telephone system by reducing maintenance costs and increasing reliability.

BELL TELEPHONE LABORATORIES

Improving telephone service for America provides careers for creative men in scientific and technical fields

SURGERY

Operation Relieves Pain

In new surgery for tic douloureux, facial nerve is not cut so numbness of face is avoided but severe pain is relieved by cutting sheath of nerve root.

➤ PATIENTS WITH the excruciatingly painful condition known as trigeminal neuralgia, or tic douloureux, may soon be getting relief through a new kind of operation.

In this condition, merely stroking the face or hair on the affected side may bring on a paroxysm of intense pain. Cause of the condition is unknown, but it is known that the pain may come in one or more of the branches of the fifth cranial nerve. This nerve has its roots in the brain somewhat forward of the ear and runs to the skin of the face, to the tongue and teeth, with branches to eye and jaw regions.

Injections of alcohol into the nerve abolish the pain temporarily. When the effects of these injections wear off, patients have hitherto had an operation in which the nerve is cut. While this stops the pain permanently, it also leaves the patient with one side of the face, tongue and the eye on that side numb.

The eye must be protected from dust or flying particles by goggles or a side piece on the eyeglasses, because the patient cannot feel when anything gets in his eye. Ulcers on the eye's cornea may result unless the eye is protected. The patient may also bite his cheek without knowing it, and pieces of food may be lost between the teeth and cheek on the affected side.

The new operation avoids these discomforts and dangers because the nerve is not cut. Instead, the sheath of the nerve root and ganglion is cut and the brain's covering membrane is freed up from the ganglion and root.

This decompressing operation was devised by Dr. P. Taarnhoj of Copenhagen, Denmark. He performed it successfully in 10 patients, with relief of pain and no other loss of sensation. Dr. Gosta Norlen of Stockholm, Sweden, who has also used the operation successfully in 10 patients, brought word of it to Dr. J. Grafton Love during a visit to this neurosurgeon at the Mayo Clinic, Rochester, Minn.

Shortly after, on June 12 of this year, Dr. Love had an opportunity to perform it. Results were equally good and he plans to use this treatment on more patients. Dr. Love's case was reported at a Staff Meeting of the Mayo Clinic. Surgeons will find Dr. Taarnhoj's report in the *Journal of Neurosurgery* (May).

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WRIST RADIO — Patterned after Dick Tracy's famous communication aid, this radio is only 1½ inches long by 2 inches wide by ¾ inch thick. A loudspeaker the size of a quarter may be worn on the coat lapel. The radio will pick up stations 100 miles away under good conditions. Developed merely as a curiosity, the radio is not available to the public. It is made possible by use of transistors and tiny hearing-aid batteries.

ENGINEERING

"Human Gophers" Boring in Mont Blanc

➤ A CREW of human gophers expect to step up boring operations to a 30-foot-a-day clip by working overtime on the giant tunnel now blueprinted and partly built through France's Mont Blanc. The tunnel, when completed, will be the longest in the world for cars, trucks and buses.

Situated on the French-Italian border, Mont Blanc's big hole will be about seven and a half miles long. The Queensway tunnel, ducking under the Mersey River between Liverpool and Birkenhead, England, at present holds the record length for vehicular traffic. Figures show it is just under two miles long.

Already under construction at both the French and Italian ends, the Mont Blanc tunnel will link France, Switzerland and Italy by an overland highway shorter and more convenient to travel than present roads. It will save motorists 187.5 miles between Paris and Rome.

The vast project will cost a total of $20,000,000, to be paid for in part by users. The rest of the cost will be split between the governments of France, Italy and Switzerland. Motorists should be whisking through the subterranean passage in about three years, engineers estimate.

When completed, the 150-year-old engineering dream will connect Chamonix, France, with Courmayer, Italy. It will be 39 feet wide and 32½ feet high. Eight giant fans will circulate fresh air through the tunnel. Two sidewalks will run along the roadway for the convenience of maintenance and repair crews.

Already workmen have chiseled nearly 4,000 feet through the granite-hard Mont Blanc on the Italian side. Road crews figure they can chip out 30 feet a day by working overtime.

Although completely underground, the tunnel nevertheless will rise to 3,000 or 4,000 feet above sea level as it pierces the mountain. Because of its high elevation, it has picked up the nickname "skyline tunnel."

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AERONAUTICS

Safer Bail-out Aided By Ejector Cockpit

➤ SAFER "BAIL-OUT" from jet planes traveling at near the speed of sound is promised with an ejector cockpit for the pilot which can be expelled at high speed from the plane in emergencies by a simple release device. The entire cockpit, including the pilot, is ejected as a unit.

For simplicity, the bail-out equipment is called a cockpit capsule. It houses the pilot in flight. If found necessary to abandon the plane while traveling at supersonic speed, he touches off a rocket charge which expels the entire capsule, with pilot inside, clear of the craft.

Three fins immediately unfold at the rear end to stabilize the capsule and a small parachute pops out to slow its forward speed. When a safe speed is reached, a main parachute opens which lowers the capsule at a gentle rate of descent to the surface of the earth.

This cockpit capsule is a development by Douglas Aircraft Company in cooperation with the U. S. Navy Bureau of Aeronautics. Preliminary tests are now being made. These already include driving the capsule by rocket propulsion down a two-mile aeroballistic track at a naval test station at the speed of sound, close to 760 miles per hour.

The entire cockpit capsule is sealed and pressurized to protect the pilot against fatal atmospheric conditions prevailing at altitudes above 50,000 feet. If it lands on water in a descent, it floats. Wave motion pumps fresh air into it. The capsule contains survival equipment and supplies similar to those provided on life rafts.

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METEOROLOGY

New Rainmaking Methods

Experiments now being conducted in Australia and Hawaii test possibility of bringing rain by seasoning clouds with salt or spraying with water.

➤ MAN MAY soon make rain by seasoning clouds with salt. Or he may make rain by spraying a cloud with water.

Experiments to find out whether this is feasible are now being carried out in Australia and Hawaii. The Australians claim to have emptied cumulus clouds of their water merely by spraying droplets of the right size into the base of the cloud.

The theory is that drops big enough to fall out of a cloud must form through the coming together of lots of little drops before it can rain. However, droplets of just the right size must be present in the cloud before the coming together process starts. The Australians think they are supplying these right-sized missing droplets.

Alfred H. Woodcock, of the Woods Hole Oceanographic Institution in Massachusetts, has measured the amount of salt and the size of the salt particles to be found in rain clouds.

He has found that salt particles travel many hundreds of miles inland from the oceans, carried by marine winds. The size distribution of salt particles found inland is the same as the size distribution over the ocean. It is known that salt particles, measured in millionths of a meter, form the nucleus of rain drops over the ocean.

Mr. Woodcock's study of these salt particles shows, he says, that there is a relationship between the amount of salt in rain and the intensity of the rain. He believes that the salt particles play an important role in the formation of rain even over land.

His study suggested to him that the failure of some large clouds to produce rain may be due to the absence in them of the proper kinds of salt particles.

"If such is the case," says Mr. Woodcock, "the possibility of inducing precipitation by seeding with appropriate numbers and sizes of sea salt or other particles becomes evident."

Now Mr. Woodcock is out in Hawaii, seeing whether his theory works out in practice. The pineapple growers of the islands, vitally interested in the weather, are financing experiments in which salt is put into the air. So far no results of these experiments have been announced.

Officials at the U. S. Weather Bureau, however, are interested in both the Hawaiian and Australian experiments. They see possibilities in both theories.

Mr. Woodcock's findings on salt particles appear in the current issue of the *Journal of Meteorology* (June).

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PSYCHIATRY

How to Handle Cranks

➤ SOME MURDERS like the killing of the young girl employee of the American Physical Society might be prevented if it were generally recognized that cranks with crackpot ideas and a feeling that they are persecuted can be very dangerous.

Although those in scientific offices, men in public life and newspaper editors are especially likely to be the victims of such individuals, you or anyone might receive letters or visits from them.

It is a mistake to ignore these people, thinking that they are "harmless cranks," psychiatrists warn. It would be a good idea if there were some agency to which "nut" letters could be referred to look up the writer so that he could receive psychiatric treatment, if necessary, before crimes are committed.

What would you do if such a mentally ill person with a gun were to walk into your office? Here is some advice for you, suggestions by Dr. Winfred Overholser, superintendent of St. Elizabeths Hospital for the mentally ill, Washington, D. C.

Never argue with him. Do not try to talk him out of his ideas. If you argue, he will think you do not understand or that you, too, are in conspiracy against him.

Accede to him so far as possible.

Above all, listen attentively and respectfully. Remember, if his ideas seem crazy to you, that is because you do not know what is going on in his mind. From his point of view, and based on his distorted perceptions, his ideas and fears are completely logical and worthy of respect. Try to find out by listening who he is, who his relatives are, and where he comes from.

Assure him that you consider his complaint important and try to get him to report his grievances to the police or the FBI.

If you are scared out of your own wits, try not to show it. Do not excite your visitor by starting to scream or trying to grapple with him. He might then act, in what seems to him self-defense.

It is probably better not to call the police. In most cases they will have no power to act unless the man is chasing you with a carving knife or has actually shot you.

If you receive a threatening letter through the mail, however, you can call on the services of the FBI or the Post Office inspectors. To use the U. S. mail for this purpose is a federal offense.

Dealing with the mentally unbalanced is a daily happening for the FBI, the Secret Service and, especially, the White House Police. These men, through experience, develop a very good understanding of how to deal with such situations. They are in frequent consultation with specialists.

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SEISMOLOGY

Along Bear Mountain Fault

Epicenter of great California earthquake now located a few miles west of Tehachapi. Was second strongest in California history.

➤ EPICENTER OF the great California earthquake was along the Bear Mountain fault near Arvin, Calif., a few miles west of Tehachapi, which suffered the most damage. This was determined by preliminary geological and instrumental evidence gathered by field crews from the Seismological Laboratory of the California Institute of Technology.

Previous estimates had the epicenter located on the infamous San Andreas fault, or on the Garlock fault. However, it is located about 20 to 25 miles north and slightly east of the San Andreas fault and about the same distance northwest of the Garlock fault, Caltech seismologists said.

The quake, with a strength of 7½ on a scale which gave a reading of 8¼ for the 1906 San Francisco earthquake, was the second strongest in California history.

Dr. Beno Gutenberg, director of the Caltech seismology laboratory, predicted that aftershock activity would continue for another year. Several hundred aftershocks have already been recorded on Caltech and U. S. Coast and Geodetic Survey instruments, one at least reaching a strength of 6.

Pierre St. Amand, a Caltech graduate student in geophysics, who was sent into the field to search for the epicenter, traced a 12½ mile series of surface cracks in rock along the Bear Mountain fault, starting about four miles east of Arvin. At this point, he said, the rock was displaced three or four feet along a sloping line. This indicated that the western end of Bear Mountain moved some three feet upward and northward relative to the earth on the other side of the fault.

Dr. John Buwalka, Caltech professor of geology, who also surveyed the area, reported that in a railroad tunnel near Bealville, Calif., he saw that the tracks had been shortened some ten feet by being twisted in an S-shape. Mr. St. Amand and another Cal Tech graduate student in the field, George Shor, both reported seeing intermittent earth cracks south of Arvin which would extend the surface evidence of the Bear Mountain faulting for another 12½ miles southwestward.

There is a possibility that one or more of the aftershocks which are expected might approach the magnitude of the original shock. It is more likely, however, that only a few of them will be strong enough to be felt by residents of the area, the rest will be known only because seismographs pick them up.

A strong aftershock followed the Helena, Mont., earthquake of Oct. 18, 1935. It occurred on Oct. 31, followed by minor shocks until Nov. 28. On Aug. 4, 1946, the Dominican Republic suffered an earthquake with a strength of 8½. Four days after the Dominican quake, an aftershock with a force of 7¾ was felt. And again on Oct. 11 another aftershock with a strength of a little over 7 occurred.

Two seismological teams under Prof. Charles F. Richter and Mr. Shor have already returned from the field with quake records made with portable instruments. Other scientists are returning to the region to map the fault carefully and to try to determine the nature of the movement along it. A new portable station will be set up in the region by Mr. Shor and Ralph Gilman, laboratory technician, and also a semi-permanent station will be planned. Coast and Geodetic Survey scientists are also in the field.

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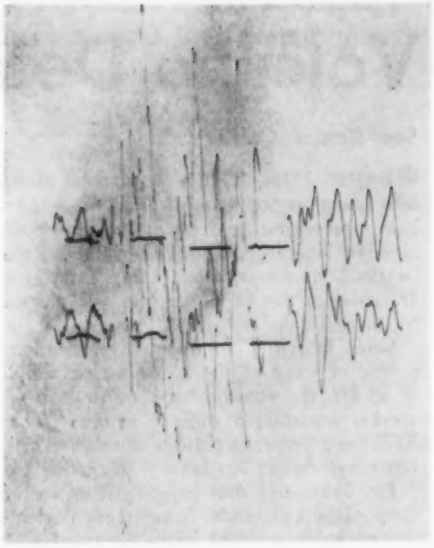

EARTHQUAKE RECORD—This is the way the intense California quake wrote its own story on the seismographs at the California Institute of Technology. The jagged up and down strokes represent vibrations of the earth's crust. The earth movement was so great at Pasadena that it broke two other seismographs and went beyond the capacity of 12 others. Magnitude of this quake was 7½, greatest since the 1906 shock in San Francisco.

INVENTION

Hammer's Handle Is Shock-Absorbing

➤ A HAMMER with a shock-absorbing handle has been invented by Axel E. Floren, Klamath Falls, Oreg. It received patent number 2,603,260. His hammer has an integral steel shank to which is attached a tubular grip at a point spaced substantially from the butt end so the hammer has a flail-like action. Between the grip and the shank is a tube of rubber.

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PUBLIC SAFETY

New First Aid For Drowning Victims

➤ FIRST AIDERS this summer will be using a new and better method for giving artificial respiration to save drowning victims.

It is called the back pressure-arm lift method and is officially recommended by the American Red Cross, U. S. Department of Defense, National Research Council and U. S. Public Health Service. Here is how you do it:

1. Place the subject in the face down, prone position. Bend his elbows and place the hands one upon the other. Turn his face to one side, placing the cheek upon his hand.

2. Kneel on either the right or left knee, at the head of the subject, facing him. Place the knee at the side of the subject's head close to the forearm. Place the opposite foot near the elbow. If it is more comfortable, kneel on both knees, one on either side of the subject's head. Place your hands upon the flat of the subject's back in such a way that the heels of the hands lie just below a line running between the arm pits. With the tips of the thumbs just touching, spread the fingers downward and outward.

3. Rock forward until the arms are approximately vertical and allow the weight of the upper part of your body to exert slow, steady, even pressure downward upon the hands. This forces air out of the lungs. Your elbows should be kept straight and the pressure exerted almost directly downward on the back.

4. Release the pressure, avoiding a final thrust, and commence to rock slowly backward. Place your hands upon the subject's arms just above his elbows, and draw his arms upward and toward you. Apply just enough lift to feel resistance and tension at the subject's shoulders. Do not bend your elbows, and as you rock backward the subject's arms will be drawn towards you. Then drop the arms gently to the ground. This completes the full cycle. The arm-lift expands the chest by pulling on the chest muscles, arching the back, and relieving the weight on the chest.

The cycle should be repeated 12 times per minute at a steady, uniform rate. The compression and expansion phases should occupy about equal time, the release periods being of minimum duration.

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VOLCANOLOGY

Volcano Dead Again

See Front Cover

➤ PARICUTIN, THE volcano that roared into being in the state of Michoacan, Mexico, nine years ago, has been completely inactive for the past four months and may be dead, in the opinion of Dr. Carl Fries, Jr., chief of the U. S. Geological Survey in Mexico.

Since March 4, following a three-month period of some of the most intense activity of its life, the volcano has produced no fireworks, not even a puff of smoke. There have been previous periods of relative calm, but never before has it been so quiet.

Dr. Fries says that judging from its formation, of the cinder cone type, Paricutin has probably reached its maximum growth and if it is not completely inactive it is in its final stages. However, authoritative opinion has pronounced the volcano dead at least twice previously in its life, and has been dramatically proved wrong by renewed explosions.

Men of the U. S. Geological Survey have been observing the volcano since its birth on Feb. 20, 1943. Detailed records of its activity since that time have been kept by the scientists and by natives of the vicinity trained by U. S. and Mexican geologists.

In the observation hut there are weather instruments and a series of charts on which the Mexican observers note the violence of explosions by comparing them with the noise of a rifle shot, or whether they are strong enough to rattle the windows of the hut or shake the entire structure. Height of the smoke column is gauged by comparing it with the height of a nearby mountain.

Maps have been constantly modified to record the direction and extension of the tongues of lava which flowed down onto the valley from the vent on the volcanio's side. Frequent aerial photographs supplement the chronicle of the volcano's life.

Accumulation of these data in regard to the life course of a volcano of this type is of use in the prediction of the course and activity of similar volcanoes.

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PUBLIC HEALTH

Gamma Globulin Test

➤ THE SECOND large scale trial of "G.G.," short for gamma globulin, as a poliomyelitis preventive started in Sioux City, Iowa, on July 21.

The first of the trials, under the direction of Dr. William McD. Hammon of the University of Pittsburgh, concluded at Houston, Tex., on July 12. A total of 33,137 Houston youngsters aged one to six were given the "shots." Half of them got gamma globulin, half a harmless substitute identical in appearance.

In the Greater Sioux City area, center of Woodbury County, Ia., and Dakota County, Nebr., the children injected were in the age group one to 11 years. The aim was to give "shots" to 16,500 children there during the six days from July 21 through July 26. The age group was picked because 67% of the polio cases in the area are among children in those ages.

The Sioux City area was picked because it is becoming one of the nation's hot spots for polio. Latest reports to the U. S. Public Health Service show cases in Iowa jumped to 72 for the week ending July 12 and to 35 in Nebraska.

The trials in Sioux City, as in Houston, were made under a grant from the National Foundation for Infantile Paralysis with blood gamma globulin furnished by the American National Red Cross. Local doctors and nurses assisted the National Foundation team in giving the "shots."

Further such trials will probably be made as the polio season progresses. Object is to learn whether gamma globulin from pooled plasma from blood banks contains enough polio-fighting antibodies to protect youngsters from the disease. The protection will not be lasting, but probably will be long enough to see the child through one polio season at least.

Which child got gamma globulin and which got a harmless substitute will be known only to the master statistician who will check all the records to see how many, if any, of the children given gamma globulin escaped polio compared with those who did not get this blood substance. It will be three or more months before his report is ready.

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GENERAL SCIENCE

Arctic Research Advances In 20 Different Fields

➤ SCORES OF scientists representing many concerns are investigating Alaskan points of scientific interest in an overall program having multi-million dollar proportions, the Alaska division of the American Association for the Advancement of Science reports.

Backed by the armed forces, federal and territorial agencies, universities and private research institutions, research work currently is going on in more than 20 scientific fields.

As a possible outcome, the AAAS predicts a general improvement of health, welfare and well-being of Alaskans, as well as speeded economic development of the area.

An example "exploring" organization is the geophysical branch of the Office of Naval Research. Currently it is studying permafrost, permanently frozen ground that creates many problems in construction work. The Navy wants to know how deep permafrost goes and how it behaves from summer to winter.

Other Navy-sponsored research in the general Alaskan area includes seismological studies which record earth movements in the Aleutian Trench; glaciological studies which probe the thickness, age and deformities of glaciers, and oceanographic studies which produce charts with up-to-date information on ocean currents, ocean depths and floating ice.

Growing scientific interest in Alaska was shown last year when more than 200 persons attended the Second Alaskan Science Conference at Mt. McKinley National Park. A third such conference is scheduled this September. The conference is expected to attract even more scientists.

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TECHNOLOGY

"Gasifier" May Solve Army's Arctic Problem

➤ A "GASIFIER" originally developed for airplane engines soon may help gasoline-powered Army equipment get started in cold arctic weather.

Engineers at the Army's Engineer Research and Development Laboratories, Fort Belvoir, Va., said the device helps engines start in less than 30 seconds and at temperatures of minus 65 degrees Fahrenheit.

It uses no external heating source. Instead, it supplements the carburetor. As the engine is cranked, the gasifier burns a small amount of the fuel under controlled conditions. Heat thus generated warms the rest of the gas, vaporizing it.

After a few minutes, the gasifier can be cut off and the engine will operate in the usual way.

Although the device solves one starting problem, it creates another. During the 30 seconds before the engine catches, cranking power must be supplied the engine. Engineers report that the value of the gasifier to the Corps of Engineers hinges on figuring out how to supply such large amounts of power at such low temperatures.

Should the device prove satisfactory, the Army expects it to save "quite a bit of money." Available figures show that $1,000,000 worth of gasoline and $2,000,000 worth of man-hours are poured down the drain each year by civilians trying to get their cars started in cold weather.

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***THROUGH THE OVERCAST**—It is this kind of low visibility landing that will be studied at MacArthur Field, New York, to improve flight safety.*

AERONAUTICS

Bad Weather Landing

Test plane to make runway approaches in bad flight conditions to find out what weather information pilot needs for safety.

➤ A THOUSAND bad-weather landings are to be made at MacArthur Field, Great Neck, N. Y. during the next two years by the same plane with the same crew in a study aimed to improve flight safety during instrument weather approaches to runways.

The project is expected to get under way by Sept. 1. It is sponsored by the U. S. Air Navigation Development Board, a military-civilian agency promoting air navigation. Cooperating are the U. S. Weather Bureau and the Sperry Gyroscope Company.

The idea behind the study is ability to give the approaching pilot in overcast weather the complete picture of weather conditions at the airport to enable him to make a safe landing. Most weather reports now given by control towers to pilots are based on the height of the cloud bases and the horizontal visibility in the general area about the airport. In addition, the pilot needs "slant visibility." He comes in on a slope from his position above the earth down to the runway. He needs to know how far he can see on this slope.

The airplane to be used in the study will have a crew of six. The same plane and the same crew members will be used to eliminate plane and human factors. During each flight it is planned to have three ground crew members stationed near the entrance end of the runway, the threshold as it is called by aviators. They will use newly-developed instruments to measure ceiling and visibility.

At the same time, crewmen on the plane will note the exact moment that the ground below becomes visible and also when runway lights become visible along the slant line. Later plane and ground observations will be coordinated. Ground crews will use two newly-developed Weather Bureau ceilometers to measure cloud height, and a transmissometer installation to measure visibility. Sky brightness will be measured by a photometer and wind velocity by anemometer.

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"Shell molding" is a technique for making castings in a shell-like sand mold varying in thickness from ⅛ to ⅜ of an inch; the sand is bonded together with a thermosetting binder.

PUBLIC HEALTH

Campaign to Wipe Out Rabies in Dogs

➤ SOME CAMPAIGNING of a non-political nature is now going on.

It is a life-saving kind of campaigning directed toward wiping out rabies, the deadly disease that brings the cry of "Mad Dog" far too often in these United States, in the opinion of American Veterinary Medical Association officials.

Each year more than 30,000 Americans have to take Pasteur anti-rabies treatment. This is a "national disgrace," the AVMA officials state.

"England, Australia and several other nations have virtually eliminated rabies, yet the disease has actually increased in the United States in the past 10 years," they point out. "It not only causes a heavy loss of animal life but is a continuing threat to human lives and should not be tolerated any longer."

Pasteur treatment does not always save human lives. It sometimes is very painful and can also cause death.

To help wipe out rabies in the United States, the AVMA suggests the following: 1. Vaccination of all dogs; 2. impounding of all stray dogs; 3. shipping restrictions on dogs which have not been vaccinated.

Vaccination against rabies protects the dog from getting the disease and thus also prevents his giving it to another animal or a human.

If bitten by a dog suspected of being rabid, or "mad," don't shoot the dog. Instead, take it to a veterinarian for observation. If the dog is not rabid, the bitten person does not need Pasteur treatment. If the dog is rabid, it will die and its brain can be examined to clinch the diagnosis.

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TECHNOLOGY

Apricot Cutter May Also Cut Costs for Growers

➤ A MODEL apricot cutter, built especially to fill the bill for California growers, is to be field tested in various parts of that state this summer.

A labor shortage and high costs of apricot production already have driven some growers to replace apricots with a more economical crop. Growers hope the cutter will help them cut costs as well as apricots.

The apricot cutter was developed by agricultural engineering specialists at the University of California's College of Agriculture, Davis. It was designed to cut the apricot along the natural suture, to take out the pit, then to spread the fruits for drying.

If the machine works, California's 175,000-ton apricot industry may receive a much-needed "shot in the arm," the University speculates.

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METALLURGY

Titanium-Alloy Engines Lessen Weight, Corrosion

➤ LIGHTER ENGINES for jet propulsion, using a titanium alloy instead of steel, are scheduled for production in the near future.

One great value, besides saving weight, is that the alloy is not subject to corrosion either from salty air or the gases to which a jet engine is subjected.

Experimental engines using the alloy have proved a success, Westinghouse engineers state in Pittsburgh. The alloy is now ready for application to the newest models of production engines that will be only three-fifths as heavy as steel engines of equal strength. Many Westinghouse jet engines are used in carrier-based Navy aircraft where salt-air corrosion resistance is of great importance.

Titanium and its alloys are relatively new in the engineering field, since commercial production of the metal from its plentiful ores is largely a post-war development and is still costly. This, however, will not prevent its use in military aircraft where cost is secondary. When cheaper methods of obtaining the metal are developed, it will have many hundreds of applications.

One of the principal deterrents to use of this metal and its alloys is a lack of knowledge relative to the metallurgy of titanium, since they have not been available long enough to develop the metallurgy fully. Much has been learned, however, in the past two years relative to the structures of titanium and its alloys, the effects of heat treatment and how it can be machined, forged and joined.

The rise of titanium, its metallurgy and its uses in jet engines is outlined in *Westinghouse Engineer*. It is described as a self-protecting metal, and one of its principal properties is its indifference to sea water.

This makes it suitable for use on shipboard, such as in lightweight piping systems to handle salt water, condenser tubes, plumbing fixtures, pump rods and rotor shafts. Titanium has high resistance to moist chlorine gas, nitric acid and many other common chemicals.

Science News Letter, August 2, 1952

PSYCHIATRY

Hospital Without Beds For Mental Treatment

➤ YOUR MENTAL picture of a hospital probably has something to do with beds. You may see them in white-sheeted rows or a single one, high, with cranks and pulleys and other contraptions.

You probably know that hospitals are measured by the number of beds they contain. They are spoken of as 150-bed hospitals, 1200-bed hospitals, and so on.

A new development in mental hospitals is the day hospital, or the "hospital without beds." This new kind of hospital is described by Drs. Ruth I. Barnard, Lewis L. Robbins and Fred M. Tetzlaff of the Menninger Foundation, Topeka, Kans., in part as follows:

"One of the major concerns of psychiatry is how to extend treatment to a greater number of people without making the treatment less effective. Out-patient shock treatment, brief psychotherapy and some forms of group therapy are attempts in this direction, or have this result as a by-product.

"The day hospital is a more recent example. It has been in use at The Menninger Foundation for three years and has already proved its worth in 'stretching' our limited facilities to serve a greater number of patients. It has also proved beneficial in other and more important ways.

"It was in 1946 that Dr. D. E. Cameron of the Allan Memorial Institute in Montreal described his new day hospital, and labelled it an experiment. The Menninger Foundation's own day hospital also began as an experiment, but after three years has so proved its value in psychiatric treatment that it has become an integral part of the Foundation's treatment program.

"As the name implies, the day hospital is for patients who need many of the therapeutic activities available in the hospital but who do not need the 24-hour protection inherent in living in the hospital. The day patient uses the hospital facilities for the hours from nine to five—or a portion of them—but lives in the community. He is not to be confused with the outpatient, whose therapy consists only of regular appointments with his doctor."

Science News Letter, August 2, 1952

METEOROLOGY

Temperature Is High On California Desert

➤ FEELING WARM these days?

A temperature reading of 150 degrees Fahrenheit is reported by Dr. Thomas Clements, University of Southern California geologist. It was this hot, he found, on California's Mojave Desert, where he was leading a scientific expedition.

Dr. Clements shoved a thermometer into the ground at a point about 30 miles east of Barstow and obtained a reading of more than 100 degrees. When he held the thermometer three feet off the ground the mercury climbed to 150 degrees. His report appears in the current issues of *Explorers Journal* (Winter-Spring).

Highest official temperature for the United States on record at the U. S. Weather Bureau is 134 degrees Fahrenheit recorded at the Greenland Ranch, Death Valley in 1913. The highest official temperature on earth was recorded in Azizia, Libya, in 1922—a reading of 136 degrees.

Official Weather Bureau temperatures, the Bureau explains, are always taken in well-ventilated shelters away from the direct or reflected rays of the sun.

Science News Letter, August 2, 1952

IN SCIENCE

INVENTION

Snow on Your Roof? Invention Removes It

➤ IF THERE were snow on your roof right now, you would probably indignantly reject an invention granted a patent recently. But next winter it may be just the thing. It is a snow removal device which can be maneuvered from indoors so you won't have to go outside and get all cold and shivery.

The inventor, Edward G. Fischer, Holliston, Mass., points out that: "In all climates where snowfalls occur a serious condition now arises whenever large amounts of snow accumulate upon the roofs and in the gutters of buildings, particularly dwelling houses having sloping roofs."

By standing on the floor below the roof, opening the window and adjusting the inventor's apparatus, the homeowner who doesn't want to get cold can scrape off the snow merely by manipulating a convenient hand lever.

The device consists of a rake with a shaft appropriately curved or bent and of sufficient length to be projected above the roof. The bottom end of the shaft is fitted to a rod which leads into the window. The homeowner operates the rake by pushing the rod back and forth through the window. Mr. Fischer received U. S. Patent number 2,603,892 for his invention.

Science News Letter, August 2, 1952

GENERAL SCIENCE

Use of Sponges Is 3,000 Years Old

➤ THE USE of sponges for washing dishes, cleaning table tops and other household chores is not new, according to Dr. Arthur Patch McKinlay, emeritus professor of Latin at the University of California at Los Angeles.

Sponges were used at least 3,000 years ago, he says, and refers to Homer's Odyssey to prove his point.

"Before a dinner party for Ulysses," he points out, "the maids were instructed to wipe off the tables with sponges.

"There are other instances, including the use of sponges in a manner somewhat akin to that of doctors today. Just as sponges are used now to absorb excess blood in operations, the Odyssey proves sponges then were used to pick up the blood resulting from Ulysses' killing of his wife's suitors."

Science may be able to invent new methods of making sponges, declares Dr. McKinlay, but the uses for them are as old as our civilization.

Science News Letter, August 2, 1952

E FIELDS

STATISTICS

Lives Getting Longer After Ages 50 and 70

➤ HERE IS cheerful news for grandfather and grandmother. Life expectancy for those of 50 and 70 has definitely improved during the first half of this century.

Some statistical studies seemed to indicate, a few years ago, that old folks now were not living as long as their parents and grandparents. But a careful inquiry by Dr. Robert J. Myers of the Social Security Administration shows there has been no significant worsening of mortality among the aged during the early part of the century.

Life expectation at age 20 has risen steadily and significantly for both men and women, with the increase over the past half-century amounting to about 15% for men and 20% for women. The expectations for men aged 50 and 70 and for women aged 70 remained more or less constant over the first 30 years of this century. Since 1930 they have risen definitely and significantly. Expectation for women aged 50 increased slowly during the first 30 years and more rapidly thereafter.

For white men age 50, 22.44 more years, white women same age, 26.16 more years.

Science News Letter, August 2, 1952

PSYCHOLOGY

Home Care of Aged Promotes Happiness

➤ "TOO WORRIED to know what to do, and too wearied to do it, even if I knew what."

That is how 65-year-old Mrs. A. put it in summing up her reasons for wanting to enter a Home for Aged Women. But three months later, Mrs. A. by her own choice and decision had got a job which she held against much younger competitors, was caring for herself in her own home, and had reached much better physical and emotional health.

This success story is told in a report from the National Institute of Mental Health on an experiment launched by the Peabody Home in New York City.

Facts had shown that a considerable number of the old people actually did not need immediate institutional care. It was really financial need, housing problems, fears relating to mild present ailments or future illness, poor family relationships, and loneliness which consistently accounted for about 85% of all admission applications.

The Board of Directors, therefore, decided to try first to remove as many as possible of the sources of anxiety in the applicant's normal environment—and then watch what happened. In essence, the plan combined the Institution's services with community resources and extended them into the old person's own environment.

Two years later the group of non-residents was studied and compared with a similar group of women who had entered the Home at the time the program was started. All the non-residents were still living and in better health. They were happier and showed more interest in outside affairs. They were self-reliant, did not think of themselves as old and often referred to the resident group as "those poor old ladies at the Home."

Finally, the cost of helping the women in their own homes was about 15% to 20% of the cost, per capita, of maintaining Home residents.

Science News Letter, August 2, 1952

ENTOMOLOGY

Ant Queen Rediscovered After Years in Jungle

➤ A QUEEN who has led an army in the jungles of Panama for five years has been rediscovered by an American Museum of Natural History expedition.

She is a queen Army Ant. In 1947 she was marked in order that the movements and the life cycle of these insects might be studied. This year she was rediscovered after long travels with her colony, miles from where she was last seen.

Her colony, numbering hundreds of thousands of ants, marched through the tropical jungle, destroying all small forest life in their path. The queen produced more than 1,500,000 eggs during these predatory and marauding wanderings.

Now the queen is performing the final phase of her functions as queen.

The expedition led by Dr. Theodore C. Schneirla, expert on insect psychology, brought back a colony of Army Ants, 40,000 strong. It is on public view and will emerge from cocoon stage in a few days. New York is so hot in summer that the exhibit case for these tropical ants must be air conditioned to cool them down to tropic temperatures.

Science News Letter, August 2, 1952

INVENTION

Carburetor Deicer Uses Hot Gases

➤ A CARBURETOR deicer has been invented by James T. W. Moseley, Richmond Heights, Mo., and assigned to the Carter Carburetor Corp., St. Louis. It received patent number 2,603,199.

The deicer utilizes hot exhaust gases in a by-pass which extends across the carburetor flange. This by-pass, the inventor claims, has been found to counteract effectively the icing tendencies around the carburetor throttle and the idling ports.

Science News Letter, August 2, 1952

OPHTHALMOLOGY

Safety Rules For Child's Eyes

➤ CHILDREN IN the United States have more eye accidents than South American children, Dr. Etta C. Jeancon of Los Angeles has reported to the National Society for the Prevention of Blindness.

She gives three reasons for this. 1. South Americans have fewer mechanical and electrical gadgets that children can get hold of; 2. South Americans supervise their children more constantly; 3. Children in South America are better disciplined.

Rocks, ball sticks and BB guns cause many unnecessary eye accidents. One little girl used an icepick to open a knot in her shoe lace. The pick slipped and penetrated her eye, Dr. Jeancon reports. A four-year-old had her lower eyelid cut off when she fell on a broken dish. A boy of five was shot in the eye with an arrow.

Safety rules for parents to follow so that their children's eyes, eyesight and health can be saved from avoidable accidents are given by Dr. Jeancon as follows:

1. Never leave the baby alone in the bathtub. Let the doorbell ring or wrap a towel around the baby and take him with you.

2. Keep medicines and poisons out of reach. Many liquids and medicines which can cause injury look harmless and taste sweet.

3. Keep matches and cigarette lighters out of reach, and keep the little ones away from stoves, bonfires and heaters.

4. Keep handles of pots turned away from the front of the stove.

5. Keep scissors, icepicks and other sharp instruments completely out of reach.

6. Remove loose parts of toys such as glass eyes on dolls that babies play with.

7. Warn against throwing rocks, tin cans, playing with stiff wire, and fighting with make-believe spears, swords, sling-shots, etc.

Science News Letter, August 2, 1952

CHEMISTRY

Moisture Corrodes Fuel Storage Tanks

➤ SCIENTISTS AT the Naval Research Laboratories in Washington have found that corrosion of motor fuel storage tanks often is due to moisture absorbed by the fuel from the atmosphere.

When exposed to air, the fuel and air exchange moisture until an equilibrium has been reached. Then if the fuel is cooled, the moisture settles out as water droplets, causing corrosion and fuel-handling troubles.

The amount of moisture absorbed depends upon the relative humidity of the air. It also depends upon the solubility of water in the fuel.

Data that may help to lick the corrosion problem are released in a Department of Commerce research report.

Science News Letter, August 2, 1952

CONCHOLOGY

Inland Sea Shells

Fossil shells found far from ocean or even high in the mountains tell of life in seas hundreds of millions of years ago.

By MARTHA G. MORROW

➤ SEA SHELLS found far inland or high in the mountains often tell of life in little-known seas hundreds of millions of years ago. The history of America's remote past is written in the sedimentary rocks of our country.

A shell picked up from the mud or clay, or cracked out of a bit of limestone, may look like shells that you find on the beach today. Some are closely related to the animals that even now crowd the ocean bottom. But most ancient shells tell of sea animals who ceased to exist here on earth millions of years ago.

There are many good places throughout the North American continent to look for fossil shells. The Atlantic coast from New Jersey to Florida is an uplifted sea bottom and thus a rewarding hunting ground for shells that are millions of years old as well as for ones that are still in the making. The Appalachian Valley is cut into fossil-bearing rock and all along it prehistoric shells may be found.

Most of the Midwest once was under sea water, so numerous shell-bearing deposits can be found there. Many mountains in the West are made up of sedimentary rocks which contain fossils.

The best time to search for fossils is right after a hard rain, when some may have been washed clean of mud. The best place to look for them is in a freshly exposed area, where the bank of a stream is being washed away, or in a road cut.

Many Different Types

There are many different types of fossils that you might find once you begin to look for them. If you are lucky, you might crack open a rock to discover the imprint of a fern that beautified the earth in its youth. The footprint of a prehistoric creature is a wonderful souvenir.

Occasionally the mummy of an early animal is preserved for man to ponder over. But much more often you will find a hard part like a bone or shell from which you can reconstruct a picture of the early creature to whom it belonged.

Fossil collecting is one of the cheapest hobbies that a person can have. All you really need is a pair of sharp eyes, a bag in which to put the specimens you pick up, and a good hammer. An ordinary hammer such as you might have in the tool chest is not adequate; you need a geologist's hammer which looks like a brick-layer's or slate-cutter's hammer.

It is not always necessary to go out into the country to look for fossils. Shells and skeletons of sea animals that lived hundreds of millions of years ago have been found right in the heart of Cincinnati, Cleveland, Chicago, Milwaukee and Buffalo.

In collecting fossils, always remember that they are evidences of ancient life and cannot be replaced. Occasionally there are only one or two of a kind, so handle with care. Take out the rock all around the fossil and label your specimen carefully, stating exactly where you found it and when. If you know the geological formation in which it was found, be sure to list it.

Do not confine your search to large fossils. Bones of ancient animals that reached a length of 80 or 100 feet long may be fun to find, but just where would you keep them? Small fossils less than an inch long are much more common.

An Aid to Dating

Certain types of fossils are wonderful aids in dating geological deposits because some animals lived here on earth for only a few thousand years, which is a short time, geologically speaking. Minute changes through the centuries in the internal structure of their shells or in their skeletons indicate quite exactly the age in which they lived.

Billions of years ago the earth was a huge ball of liquid rock, so hot that no water would stay on its surface. As the earth cooled, a hard crust formed and water accumulated in the low places. It was in this water that life on earth first began.

The first animals were small, one-celled creatures. These developed into multi-celled forms with soft bodies. The first fossils were preserved when these primitive soft-bodied creatures developed hard parts which could be preserved.

Through the years some plants and animals learned to live on dry land. Seaweed was one of the first plants to become adapted to living in air. Scorpions, which hundreds of millions of years ago looked much as they do today, and lung fishes were pioneers among the animals.

Some plants and animals, however, never did learn how to survive on dry land nor could they adapt themselves to changes that took place in the sea. Eventually many groups of them became extinct.

Even the most short-lived of the plants and animals, however, today are helping scientists put together the jig-saw puzzle of life on earth millions and even billions of years ago. Those that differ most from the plants and animals that live in the world today are the most helpful in dating deposits laid down in the sea-bottoms of the earth's crust eons ago.

Through fossils, paleontologists have been able to create a fascinating picture of the earth as it looked long before man appeared. They can visualize the animals and plants that inhabited the world long before horses developed, before mastodons lumbered through the forests and even before those 80-foot dinosaurs roamed over the land.

Though their fossils are now found on land, hundreds of millions of years ago the animals whose shells and skeletons you might unearth in your own back yard lived beneath the sea. They were preserved because they were covered by mud or sand during storms. When the sea-bottoms were uplifted and the marine water drained off, the old sea-bottoms became our sedimentary rocks. Often these rocks, in mountain-making movements, were subjected to heat and pressure so intense that the rock was altered and the fossils distorted or destroyed.

After being uplifted, rain washed some of the fossils clean of the clay and mud which had protected them through the eons. Ice and snow caused others to crack out of hard limestone in which they had been encased.

Strangely enough, shells of some rare modern sea animals that have lived from ancient times until today are abundant in fossil form. Hundreds of thousands of years ago, for instance, brachiopods with their familiar bi-valve shells lived in countless numbers along the North American coast, and the waters that spilled over the continent. Today in certain inland areas thousands of their shells can be found. But in the waters around our continent they occur in abundance in only a few places. They are found off the coast of Maine, Florida, Oregon, California and the West Indies; elsewhere they are scarce.

Climatic History

Charles Darwin saw the past more clearly than others, and told us of the evolution of man and other animals. Since his time, geologists have been interpreting the story told by fossils. They explain how some ancient shells and other sea fossils laid down during different periods show that parts of our continent have been under the sea not just once or twice but many times.

Wrinkling and shifting of the earth's crust through the ages lifted land from the sea bottom, and the forces of weather etch the uplifted land into mountains. These mountains are worn down and may again sink beneath the sea.

Although some fossil-collectors travel all over the world in search of rare specimens, others prefer to be "arm-chair" collectors. Six interesting fossils have been collected for you by SCIENCE SERVICE. Each is more

than two hundred million years old; the combined age of the six is almost two billion years.

Each specimen in the kit is a relic of the earth's ancient past. It is the original skeleton or shell of an animal that lived in sea water when the earth was younger. It represents a form of life that is extinct today.

These fossils tell of life in the Paleozoic era, which began about half a billion years ago. During this age the land began to be covered with plants and lung-fishes first came out of the water to live on land. The era ended about two hundred million years ago, when amphibians and primitive reptiles ruled the earth.

The specimens were all collected on the North American continent. They were found in Ontario, Texas, Ohio, and one even came from within the city of Cincinnati. A wide variety of people, young and old, cooperated to complete this collection.

One specimen represents the lowest, primary subdivision of the animal kingdom; another is a sponge type that no longer grows in the sea. One is the "apartment house" in which a whole colony of prehistoric creatures once lived; another shows how tiny sea shells that lived almost four hundred million years ago can be cemented together with limestone.

This fossil collection, designed to give you some idea of the kind of animals that lived in the sea over two hundred million years ago, is available for the nominal cost of 75 cents each. Just write SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for the fossil kit.

Science News Letter, August 2, 1952

BIOCHEMISTRY

Tung Nut Fat Used Tracing Fat Absorption

➤ ELEOSTEARIC ACID, a substance obtained from tung nuts grown in China, can be used as a tracer to follow the absorption of fat by the blood.

A new, rapid method of tracing fat absorption, announced by Dr. James F. Mead, chief of the biochemistry division of the Atomic Energy Project at the University of California at Los Angeles, may contribute to a better understanding of such diseases as sprue, jaundice, liver diseases and atherosclerosis.

A small blood sample can be drawn and studied in a spectrophotometer, which will record the amount of eleostearic acid in the blood. Previously, it had been necessary to remove entire intestines of animals to study their fat absorption.

The fatty acid is fed to the experimental subject with a fatty meal. At regular intervals following the meal, blood samples are taken and analyzed for eleostearic acid content.

Working with Dr. Mead were Mrs. Dorothy Long, laboratory technician, and Dr. Raymond D. Goodman, U.C.L.A. clinical instructor in medicine.

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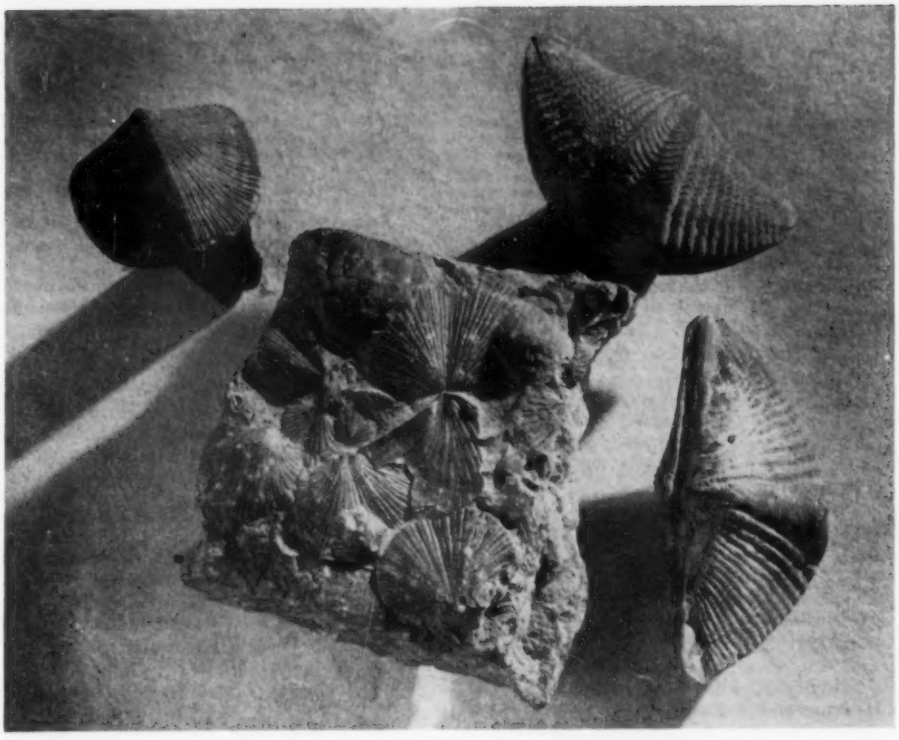

AMERICA'S PAST—These sea shells, found far inland, are all over three hundred million years old. They were collected on the North American continent and throw light on the ancient past.

GENERAL SCIENCE

Research Survey Begun

➤ AN INVESTIGATION into the nation's scientific research endeavors—in government, industry and colleges—will begin shortly. The National Science Foundation will conduct the investigation, a preliminary step to devising a national science policy.

The Foundation will try to discover how we are spending our research dollars, whether we are overemphasizing some fields at the expense of others, how our scarce resources of scientific manpower are being used.

Beginning of the work, one of the reasons for which the National Science Foundation was created, was made possible by an increase this year in the organization's appropriation. Congress came through with $4,750,000, which was $1,250,000 more than was appropriated last year.

In addition to the survey of the nation's scientific effort, the Foundation will continue supporting the fellowship program begun last year and will continue giving grants for basic research.

To conduct the survey, the Foundation will have to examine the research activities of all branches of the government—the Defense Department, the Bureau of Standards, Agriculture and others. In addition, industrial research and work being done in college and university laboratories will come in for appraisal. A study will be made of how government contracts to universities affect their overall science programs.

As a first step, the Foundation has let a pilot contract to the American Physiological Society to make a study along these lines of its branch of science. If the contract works out, other such agreements will be made. The Foundation plans to go to the scientists themselves to appraise the scientific effort of the nation.

Science News Letter, August 2, 1952

Sleeping bags filled with processed chicken feathers yield twice the warmth of wool bags.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

CHEMICAL ENGINEERING OPERATIONS: An Introduction to the Study of Chemical Plant—Frank Rumford—*Chemical Publishing Co.*, 376 p., illus., $7.50. A textbook describing the processes which are peculiar to chemical plant practice.

CHILDREN WITH IMPAIRED HEARING: An Audiologic Perspective—William G. Hardy—*Govt. Printing Office*, 22 p., 15 cents. A full program to deal with the needs of children with impaired hearing involves a number of steps here discussed.

EDUCATORS GUIDE TO FREE FILMS—Mary Foley Horkheimer and John W. Diffor, Ed.—*A. P. Horkheimer*, 12th ed., 508 p., paper, $6.00. Covering a wide range of subject matter, this book lists 2,332 titles of which 538 are new in this edition.

EMOTIONAL PROBLEMS ASSOCIATED WITH HANDICAPPING CONDITIONS IN CHILDREN—Children's Bureau—*Govt. Printing Office*, 19 p., paper, 20 cents. Regardless of the degree of the child's handicap, the attitude of his family and of the community to his handicap is of great importance in the child's adjustment.

FERNSEHTECHNIK—F. Kirschstein and G. Krawinkel—*Hirsel*, Stuttgart, 288 p., illus., DM 25.

GMELINS HANDBUCH DER ANORGANISCHEN CHEMIE—Herausgegeben Vom Gmelin—*Verlag Chemie* (Walter J. Johnson), 8th ed., illus., paper, System-Number 3, Part 2, Sauerstoff, 218 p., $15.48; System-Number 27, Part A 4, Magnesium, 336 p., $23.81; System-Number 17, Arsen, 475 p., $33.33; System-Number 41, Titan, 481 p., $27.20.

LABORATORY STUDIES IN COLLEGE CHEMISTRY—Joseph A. Babor and Alexander Lehrman—*Crowell*, 227 p., illus., paper, $2.50. Designed for the freshman course level, the manual contains 72 experiments with related problems and questions.

LANDS BEYOND—L. Sprague de Camp and Willy Ley—*Rinehart*, 329 p., $4.75. Beginning with Plato's Atlantis, the authors re-create the imaginary worlds, the geographical fantasies and myths which have always intrigued man.

THE MEASUREMENT AND CONTROL OF TEMPERATURES IN INDUSTRY—R. Royds—*Chemical Publishing Co.*, 260 p., illus., $5.00. New and important developments in this field necessitated the revision of this book, originally published under the title, THE MEASUREMENT OF STEADY AND FLUCTUATING TEMPERATURES.

PRINCIPLES OF AGRICULTURE—W. R. Williams, Translated from the Russian by G. V. Jacks—*Chemical Publishing Co.*, 156 p., illus., $3.75. Setting forth the theories of Lysenko, which have become dogma in the U.S.S.R.

SERVICES FOR CHILDREN: How Title V of the Social Security Act Benefits Children—*U. S. Children's Bureau*, 8 p., free upon request to publisher, Washington 25, D. C. For the fiscal year ending June 30, 1952, $12,524,100 was appropriated by Congress to aid the States in their maternal and child health services.

STANDARD VALUES IN BLOOD—Errett C. Albritton, Ed.—*United States Air Force* (Office of Technical Services), A. F. Technical Report No. 6039, 199 p., illus., paper, $5.25. A series of reports presenting in tabular form blood data for man and other vertebrates.

Science News Letter, August 2, 1952

SAFETY ENGINEERING

Farm Accident Season

➤FARMING IS a dangerous occupation, with harvest time perhaps the worst farm accident season. City dwellers vacationing or working on farms during this period, as well as farmers and their families, should be on special guard to avoid the dangerous and sometimes fatal accidents that may come when grain harvesting machinery, with its high-speed cutting mechanism, shafting, chains and gears, is operated in "the rush of harvest."

It is a season when haste is often emphasized without necessary caution, specialists of the Agricultural Extension Service, West Virginia University, warn.

The first step for safe operation of harvesting machinery is to put it into good condition before the harvest begins. This means that seats, controls, steps, and other similar features of the machine should be in good repair. Shields or other safety guards must be in place before a machine is taken to the field.

The National Safety Council recommends these rules for harvest safety:

1. Always be alert—never take a chance.
2. Always stop all machinery before oiling, adjusting, or unclogging.
3. Avoid wearing floppy or ragged clothing.
4. Always operate tractors at a safe speed.
5. Start smoothly and slow down for turns and rough ground.
6. Avoid operations too close to the edge of ditches or embankments.
7. Small children are definitely out of place around harvesting machinery.
8. Avoid jumping off equipment before it has come to a full stop.
9. Remember to look both ways as you approach a highway and cross with care.
10. On a highway, obey the signs and rules of the road and don't forget to use headlights and taillights at night.

"The operator of the machine must be alert and observe the safety rules—never take a chance," the Extension specialists stress.

Science News Letter, August 2, 1952

INVENTION

Chemist Receives 22 U.S. Patents on Same Day

➤ ONE MAN has received 22 patents from the government in one week. This was an unusually high number, but the Patent Office was unable to determine whether it is a record.

The prolific inventor is Melvin De Groote, University City, Mo., a chemist with the Petrolite Corporation, Ltd., Wilmington, Del. Nineteen of his patents were variations on a process for breaking petroleum emulsions. The other three were also chemical.

Mr. De Groote has received many other patents before, the Patent Office said. Believed to have held the most patents during his lifetime was Thomas A. Edison, with 1093.

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Bigger than a shoebox, the largest *gold nugget* ever found in this country weighed 214 pounds, 8 ounces troy, including a piece of quartz attached to one side; at its discovery in 1854, it was valued at about $38,000, but now it is worth twice that.

Questions

BIOCHEMISTRY — How is gamma globulin made? p. 77.

• • •

ENGINEERING—Where is the longest automobile tunnel in the world? p. 67.

• • •

METEOROLOGY—What effects are expected from shaking salt on clouds? p. 68.

• • •

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PUBLIC HEALTH—What is being tried as a polio preventive? p. 70.

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STATISTICS—How long can a 50-year-old man expect to live? p. 73.

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SURGERY—How can the pain of tic douloureux be relieved without facial numbness? p. 67.

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Photographs: Cover, Dr. Carl Fries, Jr.; p. 67, Western Electric; p. 69, California Institute of Technology; p. 71, Sperry Gyroscope; p. 75, Fremont Davis; p. 78, General Electric.

BIOCHEMISTRY

How Globulin Is Made

Substance being tried as infantile paralysis preventive is manufactured by the body as second stage of blood serum protein synthesis.

➤ BLOOD SERUM globulin, source of the disease-fighting antibodies and the material now being tried in the United States as an infantile paralysis preventive, is manufactured by the body in small granules called mitochondria in the cytoplasm of cells.

This location for globulin and antibody manufacture was announced as a "tentative" conclusion by Dr. Felix Haurowitz, professor of chemistry at Indiana University, Bloomington, Ind., at the Second International Congress of Biochemistry in Paris.

Manufacture of globulin is the second phase of blood serum protein synthesis in the body, Dr. Haurowitz finds. In the first phase a single, one-molecule-thick layer of a peptide, formed by a combination of amino acids, is reproduced and a new layer, a replica of the first, is formed.

In the second phase of protein synthesis, the newly formed peptide layer folds up to give a three-dimensional globular protein molecule.

Both these phases are highly specific. The first phase, of the single molecule thick peptide layer, has a primary specificity. The same pattern is formed for a given animal species, and the specificity is handed down from one generation to another. It is this specificity that accounts for the difference between rabbit serum protein and dog serum protein and human serum protein. Probably this phase of primary protein pattern formation takes place in the nucleus of the cell, although there are as yet no experiments to prove this.

The secondary phase, which takes place outside the nucleus in the granules of the cytoplasm, could be located at least tentatively because this phase of protein formation can be altered by the use of antigens. Antigens are substances, such as disease germs and their toxins, which call up antibody formation.

Antibodies are modified serum globulins. They are formed instead of normal serum globulins. Antibody formation may therefore be considered an aberration of normal serum protein synthesis. The peptide chain of the first phase of protein synthesis folds in a different way when antigen is introduced.

Antigens labelled by radioactive isotopes were used by Dr. Haurowitz to locate the site of the secondary folding up phase, of protein formation, in this case antibody formation.

Science News Letter, August 2, 1952

ENTOMOLOGY

Way to Stop Chiggers

➤ TINY CHIGGERS, cause of much summertime misery, can be attacked where they live by chemical dusts and sprays.

They are most often found in low, damp places well covered with vegetation, such as margins of lakes and streams, shaded woods, high grass or weeds, fruit orchards and berry patches. They may also be found on lawns, golf courses and parks.

A simple way to locate possible chigger areas is to put a piece of black cardboard edgewise on the ground and watch it for a few minutes. If you see small yellowish or pinkish mites moving rapidly over the cardboard and accumulating on the upper edge, you have located a chigger area.

Sulfur dust is the old stand-by for controlling chiggers on infested grounds. In recent years, however, a number of the newer insect killers have been found more effective. These include chlordane, lindane and toxaphene. They may be bought as dusts, wettable powders and emulsifiable concentrates. The last two must be mixed with water and applied as sprays.

Emulsion sprays will usually give the best results. A chlordane or toxaphene emulsion applied at two pounds or a lindane emulsion at one-quarter pound of the toxicant per acre will provide a high degree of control for one to two months. Wettable-powder sprays at the same dosages will give protection for two to six weeks, and dusts for one to four weeks. At one pound per acre toxaphene or chlordane applied as an emulsion spray is effective for one to two weeks, but the other formulations may not be effective at this dosage.

Apply these sprays at the rate of 20 to 25 gallons per acre, or about one gallon to 1,800 square feet. Cylindrical or knapsack-type hand sprayers may be used over small areas, but power equipment will be most satisfactory for large acreages.

Treat ground litter, soil, and the lower parts of plants with this spray.

Handle all insecticides with care. If you spill any on your skin, wash it off at once. Do not put them where they will get on fruit or vegetables or where livestock will graze within two weeks after treatment. Keep children and pets out of the treated area until the spray dries or for two or three days.

Science News Letter, August 2, 1952

• RADIO

Saturday, Aug. 9, 1952, 3:15-3:30 p.m., EDT

"Adventures in Science," with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Wallace W. Atwood, Jr., chairman of the National Committee of the United States of the International Geographical Union and a geographer from some other part of the world, will discuss the "Geography of the World."

INVENTION

Radar Pops Popcorn For Machine Vending

➤ YOU SOON may be getting your popcorn at the movies from an automatic, coin-controlled machine which pops the corn by a form of radar. Cyril Miller, Altadena, Calif., has invented a machine which uses high frequency radiation to pop each helping of corn as a coin is placed in the machine. It received patent number 2,603,142.

Science News Letter, August 2, 1952

Authoritative New

FREE BOOK For The DEAF

Does a hearing impairment become progressively worse? Are persistent or recurring ear noises a sign of deafness? Does lost hearing cause other complications?

These and other important questions of vital interest to the 15 million persons in the United States who are hard of hearing are answered in an authoritative new illustrated booklet, "How You Can Help Yourself to Hear Better." It is now available to the hard of hearing readers of this magazine without any cost or obligation whatsoever.

To obtain your free copy, which will be sent in a plain wrapper, simply send your request to: Electronic Research Director, Beltone Hearing Aid Company, 1450 West 19th Street, Department 356B, Chicago 8, Illinois. A postcard will do.

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PHYSICS

Warn of Lightning Hazards

Television antennas should be properly grounded and arrester should be put on lead-in. Do not walk in an open field during a storm or stand under a tree.

➤ NOW THAT summer electrical storms are at hand, owners of television sets may well cast wary eyes at their antennas when the skies are split by jagged streaks of lightning.

Television antennas perched on house tops throughout the country may create lightning hazards unless properly grounded. Lightning striking them may crackle from the antenna mast to a nearby plumbing vent on the rooftop, possibly setting the house on fire.

Richard L. Lloyd, lightning expert at the National Bureau of Standards, said persons can ground an antenna mast by running a wire from it to a rod driven into the ground to the permanent moisture level. The recommended size for the ground wire is AWG 2 which in its stranded form makes a wire about as big as your little finger.

The ground wire should sweep around corners gently, not cut them sharply. "Lightning doesn't like to cut sharp corners," Mr. Lloyd explained. If it hits too sharp a bend, it may go straight ahead, arcing through the air to other objects and doing considerable damage.

A wire running from the antenna mast to a plumbing vent also can ground an antenna, provided the plumbing system itself offers lightning a good path to ground.

To protect the television set completely, a lightning arrester should be put on the antenna lead-in where the antenna wires enter the building. The device, available at many radio supply stores, should be properly grounded.

Lightning protection systems can be installed to keep lightning from harming the buildings and houses it strikes. The system, composed of one or more lightning rods, is engineered so that the entire building falls within the "protective shadow" of the rods. Lightning rods also must be properly grounded.

Protecting yourself from lightning, should you be caught in a storm, is not complicated. You are safe in your car. Lightning striking the car spreads its fiery charge throughout the auto body and arcs across the wheels to ground.

If you are in an open field, seek a ditch to lie in during the storm. If no ditch is handy, just lie on the ground.

A Saskatchewan farmer reported that he saved his son, his horses and himself from being lightning-struck by means of a handy ditch.

When a storm came up, the farmer unhitched his horses from the plow and led them into the ditch. He and his son lay down with the horses. Later a brilliant lightning bolt crackled through the air and struck the plow still standing in the ground.

Lightning tends to strike the highest object in the area. Thus, if you are standing in an open field during a storm, you are in danger. If you suddenly begin to tingle all over, you are in great danger of being hit. Lie down at once.

If you seek shelter under trees, you still are in danger. Lightning bolts sometimes zig-zag sideways after hitting trees, or they may flash along the ground, killing anyone in their paths.

The latest figures show that about 300 persons are killed by lightning each year. About 240 of these persons are men. That is because men are exposed to lightning more often than women.

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If a billion acres of otherwise fertile land in the world could be irrigated, the world's *food* supply could be doubled.

The *larynx* is the voice box, a hollow space in the neck guarding the outlet of the windpipe; its cartilage walls form the "Adam's apple."

BOOKS

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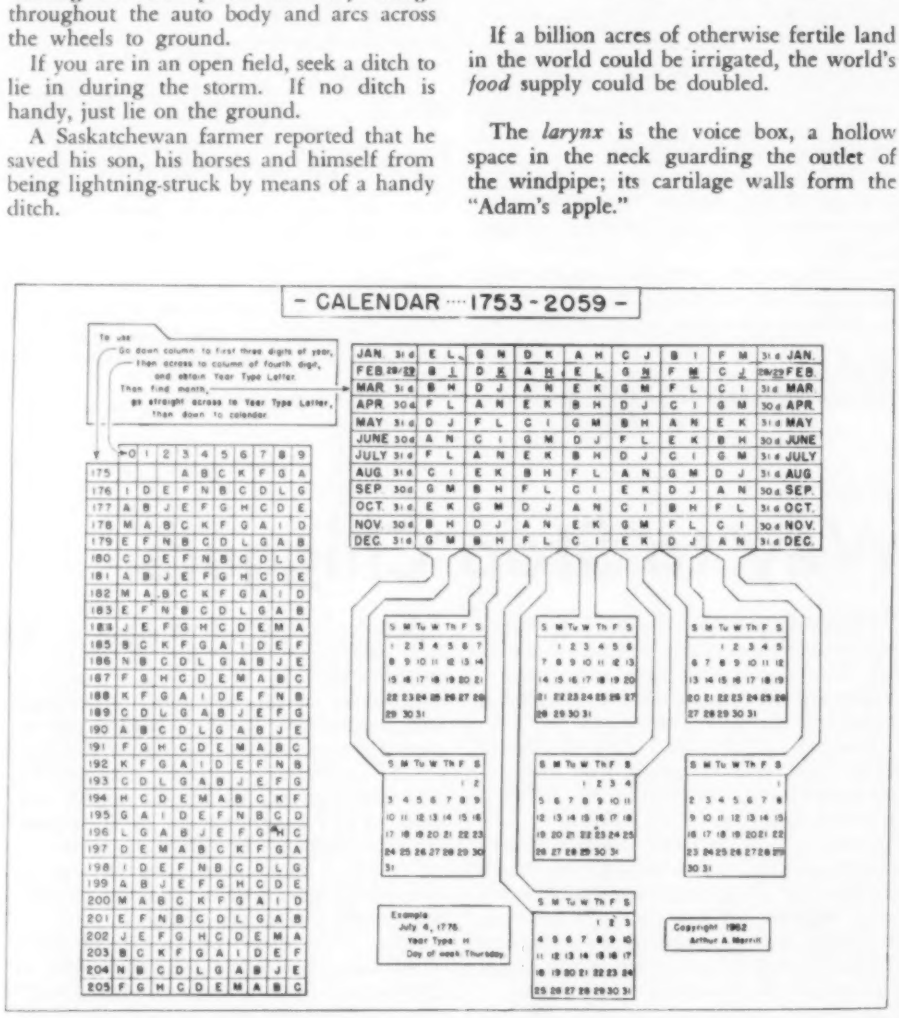
- CALENDAR ···· 1753 - 2059 -
To use
Go down column to first three digits of year, then across to column of fourth digit, and obtain Year Type Letter.
Then find month, go straight across to Year Type Letter, then down to calendar.
JAN. 31 d
FEB. 28/29
MAR. 31 d
APR. 30 d
MAY 31 d
JUNE 30 d
JULY 31 d
AUG. 31 d
SEP. 30 d
OCT. 31 d
NOV. 30 d
DEC. 31 d
Example
July 4, 1776
Year Type: H
Day of week: Thursday
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Arthur A. Merrill

PERPETUAL CALENDAR—This one is developed by Arthur A. Merrill, General Electric Company engineer. To find a date, look for the first three digits of the year in the first column of the table at left. Then under the final digit you will find a key letter. Look for this letter after the month you want, then follow down the chute to the calendar you want and you will discover on what day of the week any date fell or will fall in the future.

CLIMATOLOGY

Alaska Warming Up

Records of past 50 years show some parts are getting steadily warmer. Ports formerly ice-bound all year now open in part of summer.

➤ THE ALASKAN icebox is slowly warming up and, in the process, giving Navy and commercial shipping a helping hand.

Records seem to indicate that over the past 50 years, some parts of Alaska have been steadily getting warmer. This has resulted in some ports which formerly were ice-bound the year round, now being open to navigation for short periods during the summer. Other ports, formerly open only for a few weeks, have seen this period extended.

Meteorologists disagree whether this is a trend or merely a random fluctuation. Dr. Sverre Petterssen, now with the Air Weather Service, thinks that changes in the intensity of heat and cold sources have affected the general circulation, thus accounting for the recent warming up.

Others see evidence of a trend in the behavior of glaciers. Most of the glaciers in Alaska seem to be receding. A minority, however, continues to grow.

One of these is called Taku. A party under the direction of the American Geographical Society under contract to the Office of Naval Research is now on the glacier. This spring, the fifth year trips have been made, the party is having exceptional difficulties with late snows, the Society has announced.

Another piece of evidence supporting the warming up theory is that the permafrost, the permanently frozen ground, seems to be receding and growing thinner. Members of the U. S. Geological Survey are making measurements of permafrost in order to check up on its rate of recession.

The situation may be reversed in the antarctic. Dr. H. C. Willett, professor of meteorology at Massachusetts Institute of Technology, going through records since 1885, finds a rise of one degree Fahrenheit per year in the northern hemisphere and indications of a fall in temperature in the antarctic.

Science News Letter, August 2, 1952

NUTRITION

More Summer Eggs

➤ THE HOPE that eggs will be more plentiful, and therefore cheaper, in future summers appears in the latest feat reported for the "golden wonder drug," aureomycin.

A feed supplement containing this mold chemical upped the egg production of some low-producing hens from 26% to 57%, John and Frank Etcherberry of the Pearl Poultry Farms at Montvale, N. J., have found.

The Etcherberrys used an aureomycin and vitamin—B-12—containing feed supplement, marketed as Aurofac 2-A, for hens that had fallen behind the rest of their flock in egg production. This feed supplement has been used for some time to increase growth and improve health of poultry, but few people apparently have paid attention to its effect on egg production.

The amount of feed supplement used by the Etcherberrys was two and one-half pounds per 100 pounds of feed, which is way above the recommended dose. In such dosage the cost for an entire flock would be prohibitive. So scientists at Lederle Laboratories, where aureomycin and the feed supplement are made, are running controlled experiments to see what results can be obtained with lower dosages for both culls and high-producing hens on low cost feeds. They hope they can find a dosage which will be effective without running the cost too high.

Experiments show the summer molt is definitely being delayed in hens fed the pellets super-charged with aureomycin, so this may be the answer to the summer slack period in egg production as well as turning culls into producers. What with middlemen and other factors, however, Lederle people hesitate to say whether aureomycin can actually give consumers cheaper eggs next summer.

Science News Letter, August 2, 1952

TECHNOLOGY

Gigantic Scales Weigh Cargo on Crane Hooks

➤ A GARGANTUAN scale which can weigh up to 134 U. S. tons has been constructed by a British firm of weighing machine manufacturers.

Called a "Crane Weigher," it is primarily designed to fit on the end of a crane and to weigh huge objects of cargo directly as they are being lowered into or hauled from the holds of ships, thus combining hoisting and weighing in one single operation.

The scale has been certified correct by the British Board of Trade and shows accurate weight on its clock-dial face in units of ten hundredweights (one-half British ton) to a maximum of 120 British tons. The British use the long ton of 2,240 pounds, compared with the U. S. short ton of 2,000 pounds.

The scale itself weighs almost a ton and a half and has an over-all length of eight feet and a width of two and one-half feet.

The casing is made of cast iron, usually regarded as a weak, brittle metal, but ingenious design has enabled the manufacturers to take advantage of the principle that although cast iron is weak on extension it is extremely strong on compression.

By anchoring the upright supports with outsize bolts at the bottom at each side of the casing and having the downward pull exerted through the middle of the casing, the designers have achieved a compression effect which insures strength in the cast iron.

The particular instrument was made for an electrical manufacturing company to weigh complete transformers and alternators after construction so that certified weights for the items can be given to shipping authorities.

Science News Letter, August 2, 1952

Do You Know?

The *cubit* is one of the earliest forms of measurement; it was the length of a man's forearm.

Over 85,000 square miles in western and northwestern Canada will be mapped with the airborne *magnetometer* this summer.

Contrary to popular belief, the largemouth and smallmouth bass are not true bass at all but belong to the *sunfish* family.

Downy mildew, a fungus disease, gets its name from the downy white growth that develops on grapes which suffer early infection.

TO THE BIOLOGY TEACHER, EVERYWHERE!

You can get better microscopic slides for less! Since comparative histology tells so much about the nature of man, this study should begin in high school, and be enlarged on in the liberal arts and teachers colleges, and in the university. Like English, it should be a required study for all students in every school of intermediate and higher education. The result would be a better citizenry: better parents, better teachers, better preachers, better physicians, a better man, and a much better society, which is the purpose of education. It should always be borne in mind that nothing can justifiably take the place of knowledge based on truth; and that no discipline can tell so much about the true nature of man as modern comparative histology. Premedical students should make comparative histology their biggest course, because the medical schools devote very little time to the study of this most important discipline. The medical students should realize that knowledge of cellular biology gives meaning to pathology, anatomy and physiology and is the natural and least costly approach to all medical problems. *Begin study histology in high school.*

THE AGERSBORG BIOLOGICAL LABORATORY
Centralia, Illinois

New Machines and Gadgets

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C., and ask for Gadget Bulletin 633. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

PLANETARIUM DOME 20 feet in diameter is made of a glass fiber, impregnated with resin. When stars are projected on the dome, the illusion of the skies compares favorably with that of larger planetariums.

Science News Letter, August 2, 1952

MILDEW-RESISTING ENAMEL preserves walls and ceilings from mold where ordinary paint is covered with a profuse growth within two months. Especially good in food-processing areas, the enamel contains a non-toxic fungicide rated as the most effective yet evaluated for paint.

Science News Letter, August 2, 1952

ELECTRIC MAT, made of vinyl resin, takes the place of photo-electric cells in controlling the opening and closing of automatic doors in supermarkets, banks and department stores. When stepped upon, even by a 20-pound child, electrical contact is made in a harmless six-volt circuit and the door is opened by an air compressor. After the person passes through, the door is closed.

Science News Letter, August 2, 1952

FLEXIBLE CAST for patients undergoing X-ray and other types of treatment hardens almost instantly, yet it can be reused. A thin-walled rubber bag filled with tiny plastic granules holds the patient's body

stationary during treatment, as shown in the photograph. When evacuated, the bag becomes rigid. It becomes flexible when air is let back into it.

Science News Letter, August 2, 1952

PORTABLE PYROMETER for diesel engines is designed to be used where no permanently mounted pyrometer exists. Its thermocouples can be installed in the cylinders and exhaust line. Temperatures are checked by inserting the pyrometer prongs into the receptacles of the thermocouple's terminal head.

Science News Letter, August 2, 1952

COMBINATION COMPASS, scale, straight-edge, protractor and T-square uses a standard-sized pencil locked into place with a knurled nut. The instrument will make circles up to 15 inches in diameter. Its 8½ inch scale is graduated in sixteenths.

Science News Letter, August 2, 1952

AIR-INFLATED CORNICE for windows is blown up in a few seconds with little effort. The cornice fits over curtain rods and is held in place with special hooks. Made of a long-lasting plastic, the cornice will not chip or peel and can be cleaned with a damp cloth. The cornices are made in a variety of patterns and colors.

Science News Letter, August 2, 1952

RUG CUSHION, made of a sponge rubber formed into a mat of small arches, gives extra spring to your rugs and makes carpets last longer. Mothproof and vermin-proof, the underlay is long-lasting and creates no dust or lint to be cleaned from under the rug.

Science News Letter, August 2, 1952

Nature Ramblings

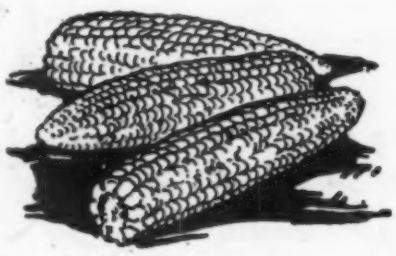
URBANITES WHO grew up in Iowa or Wisconsin or Maine or New Jersey have long complained that the sweetcorn they get in New York or Pittsburgh or Chicago was not really fit to eat.

That was no mere effect of nostalgia. They were quite correct: sweetcorn as it has been offered in city markets for many years has not been really good.

Trouble is, it has taken too long for the corn to get from cornstalk to kettle. Past harvesting and marketing methods usually made a 48-hour time gap at least; often more than that, especially if the corn were being shipped from a distant point. That is much too much, if the corn is to remain really sweet.

Other vegetables can be picked short of maturity and permitted to ripen on the road or even on the dealer's stand. With sweetcorn, the more mature it becomes, the less sugar it contains and the more starchy it is. It must not only be picked immature, it must be eaten that way or it is no good.

Sweeter Sweetcorn



There is an enzyme in sweetcorn that gets to work on its sugar the moment the cob is severed from the stalk, converting it into starch. Corn canners found that out long ago. They begin a day's operation with corn picked very early the same morning—even by artificial light. Every ear left on the floor when they shut down for the night is discarded. Corn 24 hours old is unfit to pack, by modern standards.

At long last, city consumers of fresh corn are now often able to get the same kind of a break. Under the leadership of energetic scientists at several state agricultural experiment stations, dawn-picked ears are rushed direct to retail dealers by truck and are ready for sale when the early housewives market. These early birds get the wormless ears, and the juiciest.

Not even this would satisfy some corn gourmets, who insist that if an ear is off the stalk longer than ten minutes, it is no longer sweetcorn, but just corn. A few extremists even carry kettles of hot water into the corn-patch with them, husk the ear before snapping it off, and pop it into the water instantly.

To do this kind of thing, however, requires that you grow your own corn. For people who have to live and work far from the nearest possible garden-plot, the newer marketing methods offer the best possible substitute.

Science News Letter, August 2, 1952